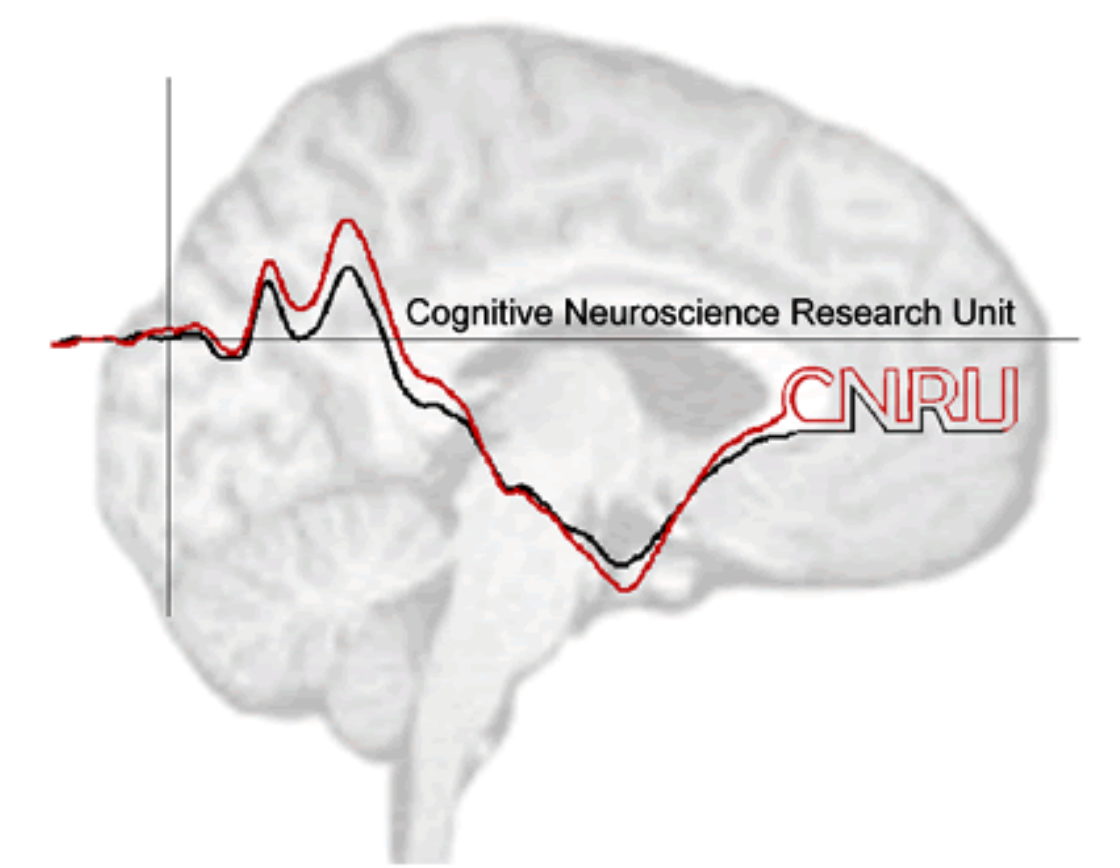


# Aesthetic preferences modulate Mu activity over sensorimotor cortices during action observation of dance

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## INTRODUCTION

- ❖ Evidence of the role of the sensorimotor cortex (SMC) -and more generally the mirror neuron system, in aesthetic appraisal, have been shown during art appreciation in different fields such as painting (1), sculpture (2) or architecture (3).
- ❖ Activation in the mirror neuron system can be measured by the mu desynchronization registered in the alpha band (8-13Hz)
- ❖ **AIM:** Identifying the neural correlates within the SMC during aesthetic dance observation. And explore the lateralization and chronology of the SMC response during art evaluation.
- ❖ **HYPOTHESIS:** we predict significant differences in the mu-desynchronization index over the SMC between observation of 'liked' and 'disliked' dance videos.

## METHODS

**PARTICIPANTS:** N=27, mean age: 25.7 years old; SD= 4.82 (no dance experience)

**STIMULI:** A selection of videos from Christensen's library (4,5) were used as stimuli. These 48 videos (24 sad + 24 happy valence) were selected. Videos were 5-6s long.

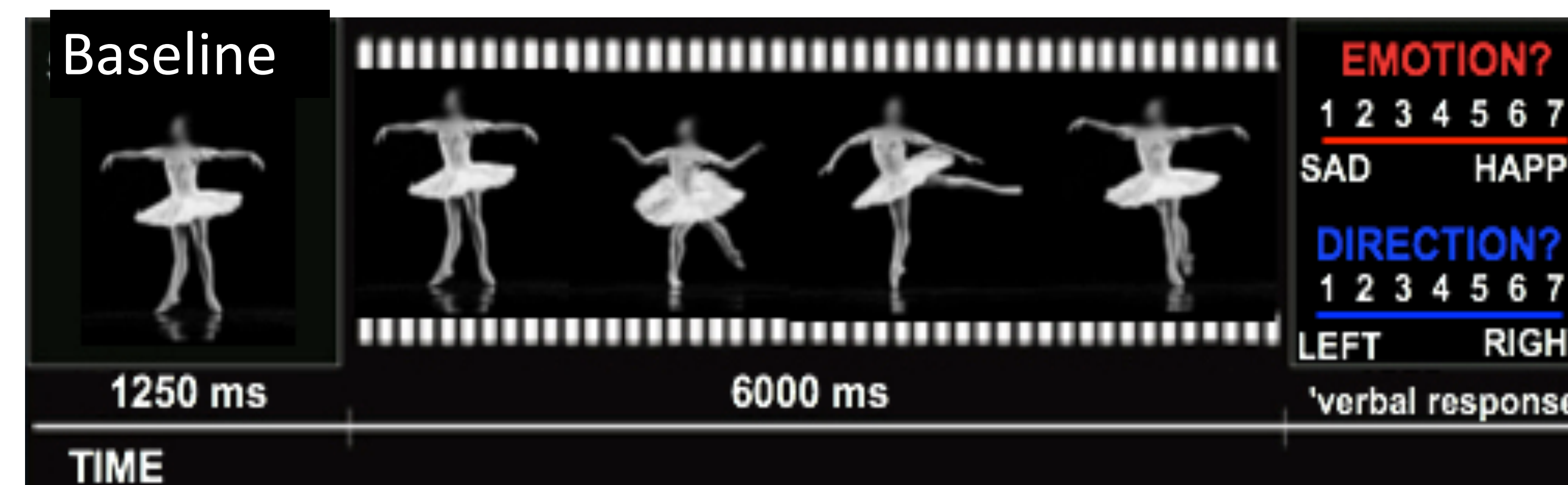
**TASK EEG recording:** Similar paradigm as in Calvo-Merino et al. (2008) (6). Brain activity was recorded (EEG) while participants watched 6 sec dance ballet videos and answer (verbally) 2 different questions presented in different blocks (see Poster Corradi et al.CNS2020, for further information) related to the perceived emotion and the direction of the movement.

**LIKING TASK after the EEG session:** Participants watched again the dance videos and rated them in a 0-100 preference scale (0=dislike, 100=like).

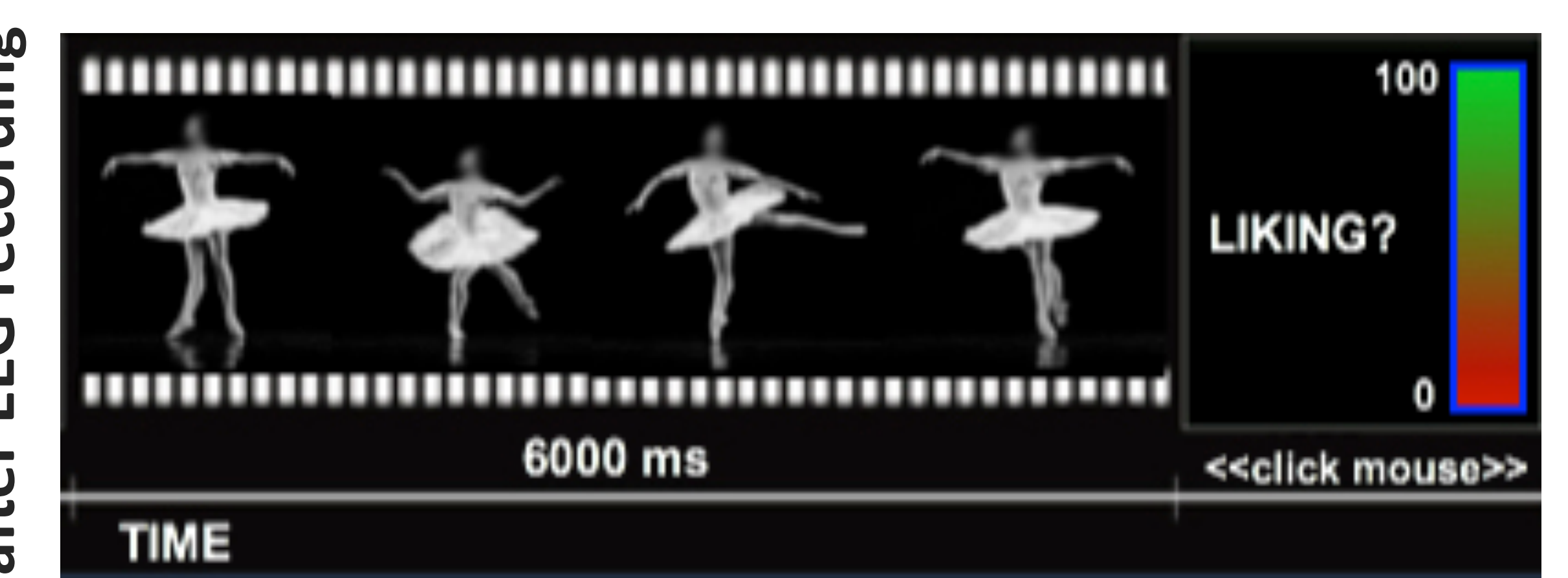
### DATA PROCESSING:

For each participant, dance videos were ranked based on their aesthetic score and split in two groups: the 50% highest scores formed the 'LIKED' group, the lowest 50% the 'DISLIKED' (or liked less) group. For each video, mu power was estimated by the log transformed ratio between the stimuli onset compared to the baseline (static image). Mu power from electrodes (11 and 17 C4/C3 respectively, over SMC) were extracted to further analysis. Occipital electrodes were also analyzed as control regions.

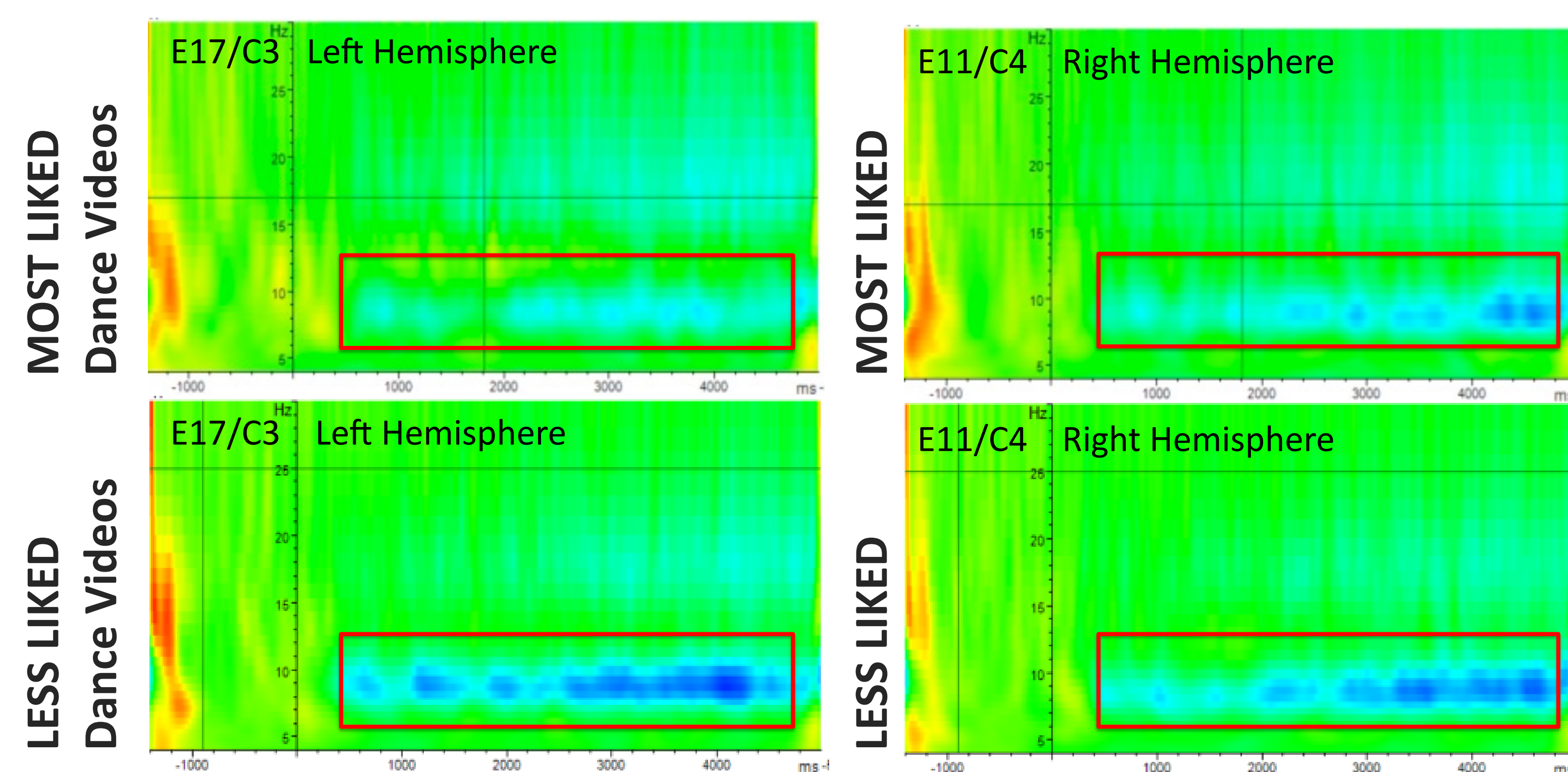
Task during EEG recording (emotion and direction of movement)



Task Liking after EEG recording

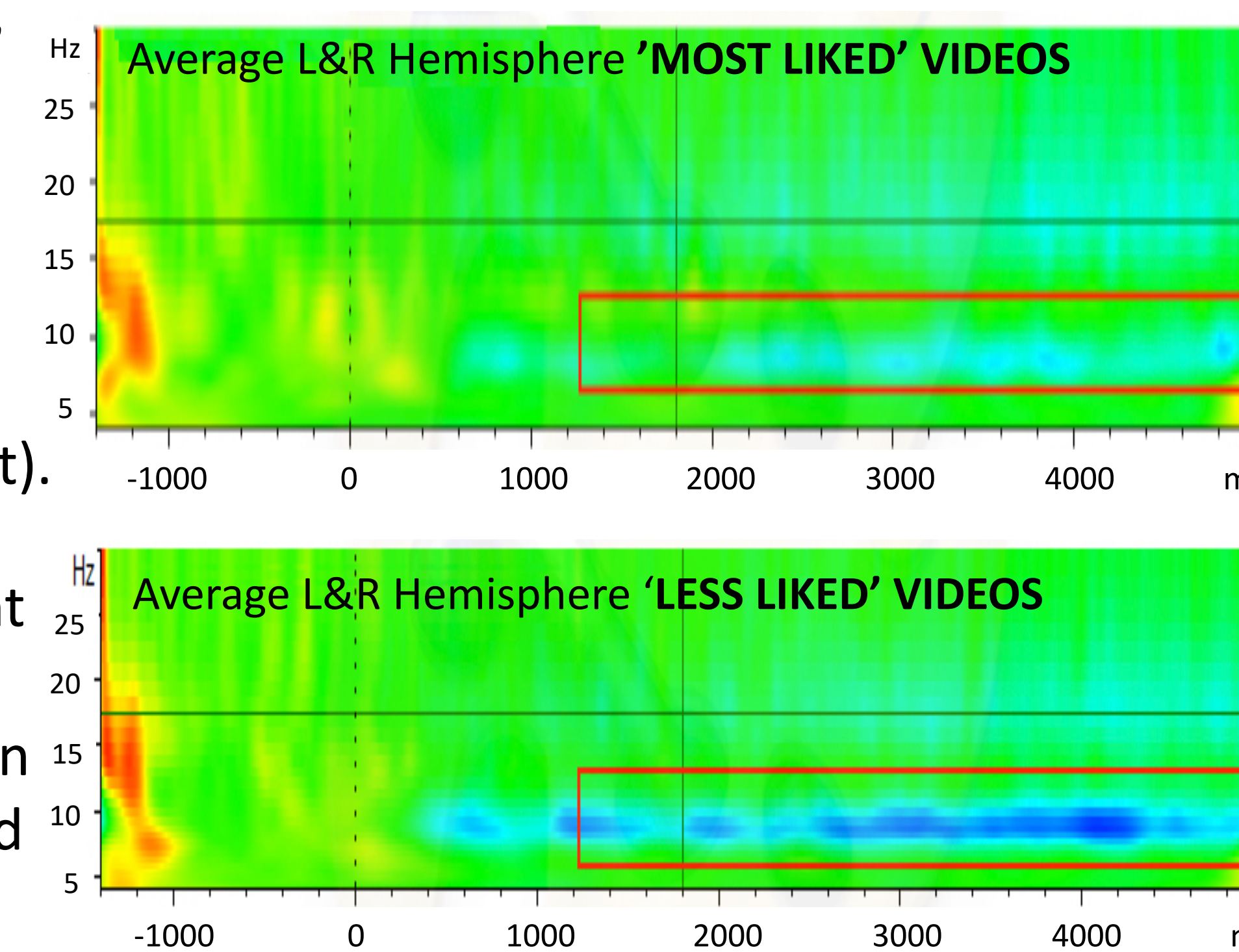


## RESULTS



### 2x2 Anova (Liked vs disliked, Hemisphere L/R):

- An interaction between **liking\*hemisphere** was found ( $F=4.34; p<.05$ ) in SMC, but no in the occipital cortex (Figure left).
- We also found a significant main effect of **liking** ( $p<.001$ ) less mu suppression during observation of liked videos (Figure right).

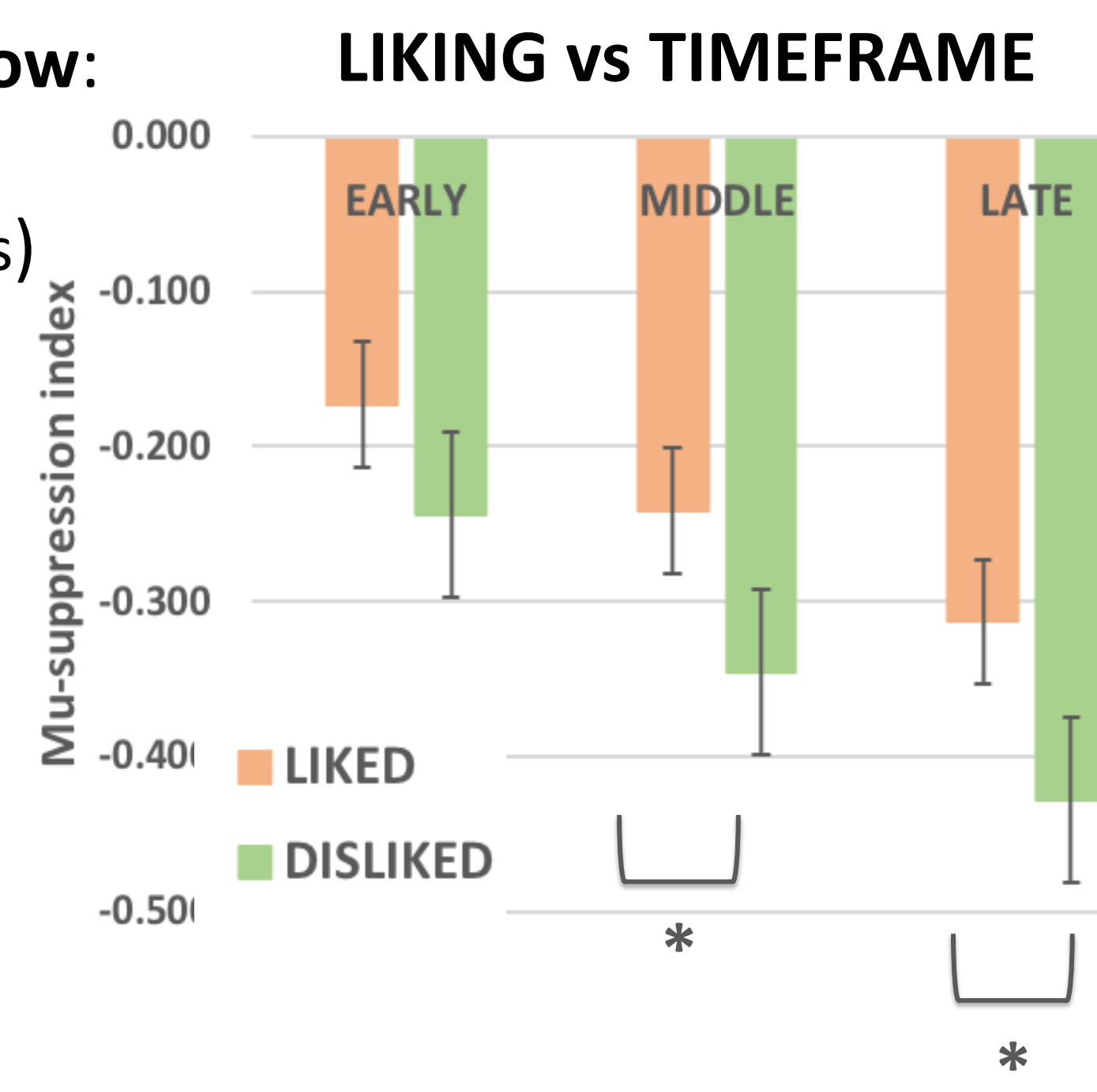


### 2x3 Anova

Liking vs Time window:

- EARLY (200-1732ms)
- MIDDLE(1734-3266ms)
- LATE (3268-4800ms):

- main effect of **liking** in MIDDLE & LATE ( $p<.05$ ).



## CONCLUSION

- **Lateralized sensorimotor response of positive liking:** Observing liked movements evokes stronger sensorimotor response over the RH, than the LH. This lateralization is not observed when looking at less preferred dance movements.
- **Main effect of liking** suggest a stronger sensorimotor response (more mu suppression) when observing dance movements we liked less, than when looking at dance movements we liked more.
- **Timing and liking** sensorimotor engagement increases over time during observation of the dance movement

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